CALIAN
Confidence. Engineered.

Advanced Technologies

13.2m Radio Telescopes

Calian 13.2m Radio Telescopes provide high accuracy, high efficiency Cassegrain optics and high-speed slewing systems. The use of advanced manufacturing techniques results in a major step forward in affordable precision antenna and telescope systems design. They offer exceptional pointing precision and reflector surface accuracy, making them ideal for advanced VLBI, scientific, radar and other array applications. This antenna has been deployed widely and is field-proven. The antenna can be fitted with several different feeds to support your application. Our ground station integration experience in the scientific, radar and satellite industry means this antenna is designed to meet the needs of your network.

Specifications

General Configuration

Configuration:	Dual reflector Cassegrain design 2 axis motion, elevation over azimuth
Main reflector:	13.2m diameter Precision formed aluminum Surface accuracy below 0.008” RMS
Sub reflector:	High accuracy composite Surface accuracy below 0.002” RMS
Hub:	Up to 10 ft/3.05m diameter for RF equipment integration
Pedestal:	State of the art cable wrap systems with ample space for customer cables.
Optional:	Platform with staircase and hoist De-icing system Environmentally controlled hub Adjustable polarization

M&C Interface

Ethernet interface for M&C and user interface.

Full remote operation and monitoring with multiple tracking options.

The antenna can be controlled via the provided computer software application or via a customer interface.

Mechanical Performance

Pointing accuracy:	< 0.005°
Speed:	up to 12°/s in azimuth up to 6°/s in elevation
Acceleration:	3°/s2 in both axis
Travel range:	±270° in azimuth (540° continuous) 0°-90° in elevation
Drives:	Dual torque biased backlash-free drives in both axes

Power

Drive Systems:	480VAC 50/60Hz 3-phase
De-icing System:	208/220 3 phase
Auxiliary Circuits:	208VAC split phase 60 Hz 220VAC single phase 50 Hz (optional)

Feed

Supports single, dual, tri-band feeds, e.g., S to Ka, S/X, C/Ku, X/Ku, X/Ka, Ku/Ka, S/X/Ka, etc.

LP and CP broadband feed options available

Tracking Options

Multiple open and closed loop tracking options include: Program track, NORAD TLE, IESS-412, Monopulse (optional), Step Track (optional)

Environmental Performance

Temperature:	Operational -30 to +60 °C Survival -40 to +70 °C
Seismic:	0.3g horizontal and vertical
Wind speed:	Operational 72kph (45 mph) Gusting up to 100 kph (62 mph) Survival, 200 kph (125 mph) in stow position
Humidity:	0 to 100% with condensation
Ice Accumulation:	30mm thick on all exposed surfaces
Corrosion:	Galvanized ASTM-A123, stainless and galvanized fasteners, multi-layer epoxy-based paint.

Shipping Configuration and Features

Modular design to allow for easy shipping in standard containers.

Rapid deployment, assembly and commissioning at customer site.

Ka-band Performance

	Rx	Tx
Frequency (GHZ)	17.70 - 21.50	27.50 - 31.00
Feed Ports	2CP + 2 Monopulse	2CP
Antenna Gain	67.42 dBi @21.5 GHz	70.12 dBi @31 GHz
Beamwidth @ -3dB	0.08°	0.06°
G/Ts at Clear Sky with 120 K LNA @ 20° Elevation		
17.70 GHz	42.85 dB/K	
19.60 GHz	43.54 dB/K	
21.50 GHz	43.76 dB/K	
Power handling, per port (CW)	500 watts	500 watts
VSWR (Feed interface)	1.25	1.25
Cross Pol Isolation (Axial Ratio)	32.78 dB (1.047)	32.78 dB (1.047)
Port to Port Isolation $R_x \rightarrow T_x$, $T_x \rightarrow R_x$	85 dB	85 dB
Port to Port Isolation $R_x \rightarrow R_x$, $T_x \rightarrow T_x$	20 dB	20 dB
Sidelobes	Meets ITU-R S-580-6	Meets ITU-R S-580-6

Ku-band Performance

	Rx	Tx
Frequency (GHZ)	10.70 – 12.75	12.70 – 14.50
Feed Ports	2LP + 2 Monopulse	2LP
Antenna Gain	63.13 dBi @12.75 GHz	64.35 dBi @14.50 GHz
Beamwidth @ -3dB	0.14°	0.12°
G/Ts at Clear Sky with 59 K LNA @ 20° Elevation		
10.70 GHz	40.77 dB/K	
11.75 GHz	41.51 dB/K	
12.75 GHz	42.18 dB/K	
Power handling, per port (CW)	500 watts	500 watts
VSWR (Feed interface)	1.25	1.25
Cross Pol Isolation	35 dB	35 dB
Port to Port Isolation $R_x \rightarrow T_x$, $T_x \rightarrow R_x$	85 dB	85 dB
Port to Port Isolation $R_x \rightarrow R_x$, $T_x \rightarrow T_x$	35 dB	35 dB
Sidelobes	Meets ITU-R S-580-6	Meets ITU-R S-580-6

X-band Performance

	Rx	Tx
Frequency (GHZ)	7.25 – 7.75	7.90 – 8.40
Feed Ports	2CP + 2 Monopulse	2CP
Antenna Gain	58.93 dBi @7.75 GHz	59.62 dBi @8.40 GHz
Beamwidth @ -3dB	0.22°	0.20°
G/Ts at Clear Sky with 50 K LNA @ 10° Elevation		
7.25 GHz	37.97 dB/K	
7.50 GHz	38.26 dB/K	
7.75 GHz	38.55 dB/K	
Power handling, per port (CW)	500 watts	500 watts
VSWR (Feed interface)	1.30	1.30
Cross Pol Isolation (Axial Ratio)	32.78 dB (1.047)	32.78 dB (1.047)
Port to Port Isolation $R_x \rightarrow T_x$, $T_x \rightarrow R_x$	85 dB	85 dB
Port to Port Isolation $R_x \rightarrow R_x$, $T_x \rightarrow T_x$	18 dB	18 dB
Sidelobes	Meets ITU-R S-580-6	Meets ITU-R S-580-6

C-band Performance

	Rx	Tx
Frequency (GHZ)	3.400 – 4.200	5.725 – 6.725
Feed Ports	2CP + 2 Monopulse	2CP
Antenna Gain	53.84 dBi @4.200 GHz	57.91 dBi @6.725 GHz
Beamwidth @ -3dB	0.44°	0.27°
G/Ts at Clear Sky with 30 K LNA @ 20° Elevation		
3.400 GHz	32.80 dB/K	
3.800 GHz	33.77 dB/K	
4.200 GHz	34.62 dB/K	
Power handling, per port (CW)	5000 watts	5000 watts
VSWR (Feed interface)	1.25	1.25
Cross Pol Isolation (Axial Ratio)	32.78 dB (1.047)	32.78 dB (1.047)
Port to Port Isolation $R_x \rightarrow T_x$, $T_x \rightarrow R_x$	85 dB	85 dB
Port to Port Isolation $R_x \rightarrow R_x$, $T_x \rightarrow T_x$	20 dB	20 dB
Sidelobes	Meets ITU-R S-580-6	Meets ITU-R S-580-6

S-band Performance

	Rx	Tx
Frequency (GHZ)	2.170 – 2.300	1.980 – 2.120
Feed Ports	2CP + 2 Monopulse	2CP
Antenna Gain	48.63 dBi @2.300 GHz	47.92 dBi @2.120 GHz
Beamwidth @ -3dB	0.74°	0.81°
G/Ts at Clear Sky with 45 K LNA @ 20° Elevation		
2.170 GHz	27.96 dB/K	
2.235 GHz	28.21 dB/K	
2.300 GHz	28.46 dB/K	
VSWR (Feed interface)	1.25	1.25
Cross Pol Isolation (Axial Ratio)	32.78 dB (1.047)	32.78 dB (1.047)
Port to Port Isolation $R_x \rightarrow T_x$, $T_x \rightarrow R_x$	85 dB	85 dB
Port to Port Isolation $R_x \rightarrow R_x$, $T_x \rightarrow T_x$	20 dB	20 dB
Sidelobes	Meets ITU-R S-580-6	Meets ITU-R S-580-6

Contact Rob or Mohamed today.

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